

**Notice of Allowability**

Application No.

10/634,394

Examiner

Danny Wai Lun Leung

Applicant(s)

KUNIMATSU ET AL.

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to communication filed 12/10/2003.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 11164053.04
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

  
KENNETH VANDERPUYE  
SUPERVISORY PATENT EXAMINER

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The application has been amended as follows:

#### ABSTRACT:

An apparatus having n-number of working cross-connects for cross-connecting an n-bit input signals arriving from a plurality of input paths on a per-bit basis; n-number of first logic circuits for calculating the exclusive-ORs of each said n-bit and applying outputs to a standby cross-connect for providing outputs; n-number of second logic circuits for calculating the exclusive-ORs of said output signals from each of said working cross-connects and from the single standby cross-connect; and third logic circuits for selecting output signals of said working cross-connects and outputs of the second logic circuits. The apparatus detects the occurrence of an abnormality in working cross-connects by monitoring the outputs of the second logic circuits, identifies the faulty cross-connect by successively turning off one of the n-inputs to the first and

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second logic circuits, and select outputs from the second logic circuits instead of from the faulty cross-connect by using the third logic circuits.

*Allowable Subject Matter*

3. Claims 1-9 are allowed over prior art.

*Conclusion*

4. The following is an examiner's statement of reasons for allowance:

Prior art made of record fails to teach an optical cross-connect fault detection apparatus comprising:

m-number of first logic circuits respectively for calculating the exclusive-OR of the first to  $n^{\text{th}}$  bit data of an input signal that arrives from an  $i^{\text{th}}$  input path ( $i=1$  to  $m$ );

a standby cross-connect having an  $i^{\text{th}}$  terminal to which is input an output signal of a first logic circuit that corresponds to the  $i^{\text{th}}$  input path ( $i=1$  to  $m$ );

m-number of second logic circuits respectively for calculating the exclusive-OR of signals output from the  $j^{\text{th}}$  terminals ( $j=1$  to  $m$ ) of the first to  $n^{\text{th}}$  working cross-connects and of said standby cross-connect

The examiner found no suggestions or motivations to combine similar teachings from prior art made of record to overcome the limitations as discussed above.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to cross-connect apparatus in general:

US Patent No. 5,218,465 to Leiby et al. discloses an intelligent interconnects for broadband optical networking, comprising logic circuits controlling a plurality of cross-connects.

US Patent No. 6,829,436 to Koh et al. discloses an optical cross-connect device with transparency comprising a controller performing XOR operation in controlling a cross connect apparatus.

US Patent No. 5,937,117 to Ishida et al. discloses an optical cross connect system comprising a plurality of working and standby cross connects.

US Patent No. 6,441,935 to Araki et al. discloses an optical packet exchange system and optical switch comprising a plurality of input units, and a logic circuit including an XOR circuit, in determining control parameter for an optical cross connect.

US Patent No. 5,754,320 to Watanabe et al. discloses an optical cross-connect system with a plurality of working and standby cross-connects.

US Patent No. 5,193,087 to Lichtash et al. discloses a digital cross-connect system provided with a plurality of input terminals, controlled by a controllers in multiple stages.

US Patent No. 5,040,170 to Upp et al. discloses a system for cross-connecting high speed digital signal, including an XOR operation for manipulating input signals.

US Patent No. 5,859,776 to Sato et al. discloses a method for controlling a logic element such that parameters  $i$  and  $k$  varies from  $j$  to  $n$ .

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 9:30am-7:00pm Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DWL  
April 14, 2006



KENNETH VANDERPUYE  
SUPERVISORY PATENT EXAMINER